



COPY OF PAPERS  
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<110> Nuttall, Patricia  
Paesen, Guido Christiaan

<120> Histamine and Serotonin Binding  
Molecules

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<160> 31

<170> FastSEQ for Windows Version 4.0

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<212> PRT

<213> Rhipicephalus appendiculatus

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Gln Asp Ala Trp Lys His Leu Gln Lys Leu Val Glu Glu Asn Tyr Asp  
35 40 45  
Leu Ile Lys Ala Thr Tyr Lys Asn Asp Pro Val Trp Gly Asn Asp Phe  
50 55 60  
Thr Cys Val Gly Thr Ala Ala Gln Asn Leu Asn Glu Asp Glu Lys Asn  
65 70 75 80  
Val Glu Ala Trp Phe Met Phe Met Asn Asn Ala Asp Thr Val Tyr Gln  
85 90 95  
His Thr Phe Glu Lys Ala Thr Pro Asp Lys Met Tyr Gly Tyr Asn Lys  
100 105 110  
Glu Asn Ala Leu Thr Tyr Gln Thr Glu Asp Gly Gln Val Leu Thr Asp  
115 120 125  
Val Leu Ala Phe Ser Asp Asp Asn Cys Tyr Val Ile Tyr Ala Leu Gly  
130 135 140  
Pro Asp Gly Ser Gly Ala Gly Tyr Glu Leu Trp Ala Thr Asp Tyr Thr  
145 150 155 160  
Asp Val Pro Ala Ser Cys Leu Glu Lys Phe Asn Glu Tyr Ala Ala Gly  
165 170 175  
Leu Pro Val Pro Asp Val Tyr Thr Ser Asp Cys Leu Pro Glu  
180 185 190

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MAY 13 2002

TECH CENTER 1600/2900

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<212> PRT  
<213> Rhipicephalus appendiculatus

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Val Lys Gly Asn Gln Pro Asp Trp Ala Asp Glu Ala Ala Asn Gly Ala  
20 25 30  
His Gln Asp Ala Trp Lys Ser Leu Lys Ala Asp Val Glu Asn Val Tyr  
35 40 45  
Tyr Met Val Lys Ala Thr Tyr Lys Asn Asp Pro Val Trp Gly Asn Asp  
50 55 60  
Phe Thr Cys Val Gly Val Met Ala Asn Asp Val Asn Glu Asp Glu Lys  
65 70 75 80  
Ser Ile Gln Ala Glu Phe Leu Phe Met Asn Asn Ala Asp Thr Asn Met  
85 90 95  
Gln Phe Ala Thr Glu Lys Val Thr Ala Val Lys Met Tyr Gly Tyr Asn  
100 105 110  
Arg Glu Asn Ala Phe Arg Tyr Glu Thr Glu Asp Gly Gln Val Phe Thr  
115 120 125  
Asp Val Ile Ala Tyr Ser Asp Asp Asn Cys Asp Val Ile Tyr Val Pro  
130 135 140  
Gly Thr Asp Gly Asn Glu Glu Cys Tyr Glu Leu Trp Thr Thr Asp Tyr  
145 150 155 160  
Asp Asn Ile Pro Ala Asn Cys Leu Asn Lys Phe Asn Glu Tyr Ala Val  
165 170 175  
Gly Arg Glu Thr Arg Asp Val Phe Thr Ser Ala Cys Leu Glu  
180 185 190

<210> 3  
<211> 200  
<212> PRT  
<213> Rhipicephalus appendiculatus

<400> 3  
Met Lys Val Leu Leu Leu Val Leu Gly Ala Ala Leu Cys Gln Asn Ala  
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Asp Ala Asn Pro Thr Trp Ala Asn Glu Ala Lys Leu Gly Ser Tyr Gln  
20 25 30  
Asp Ala Trp Lys Ser Leu Gln Gln Asp Gln Asn Lys Arg Tyr Tyr Leu  
35 40 45  
Ala Gln Ala Thr Gln Thr Thr Asp Gly Val Trp Gly Glu Glu Phe Thr  
50 55 60  
Cys Val Ser Val Thr Ala Glu Lys Ile Gly Lys Lys Lys Leu Asn Ala  
65 70 75 80  
Thr Ile Leu Tyr Lys Asn Lys His Leu Thr Asp Leu Lys Glu Ser His  
85 90 95  
Glu Thr Ile Thr Val Trp Lys Ala Tyr Asp Tyr Thr Thr Glu Asn Gly  
100 105 110  
Ile Lys Tyr Glu Thr Gln Gly Thr Arg Thr Gln Thr Phe Glu Asp Val  
115 120 125  
Phe Val Phe Ser Asp Tyr Lys Asn Cys Asp Val Ile Phe Val Pro Lys  
130 135 140  
Glu Arg Gly Ser Asp Glu Gly Asp Tyr Glu Leu Trp Val Ser Glu Asp

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<213> Rhipicephalus appendiculatus
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			20					25					30						
Gly	Trp	Gln	Phe	Leu	Lys	Lys	Gly	Lys	Arg	Tyr	Asp	Met	Lys	Gln	Arg				
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Thr	Phe	Gln	Thr	Pro	Asn	Ser	Asp	Asp	Thr	Lys	Cys	Leu	Ser	Ser	Thr				
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Ile Asp Gly Lys Asn Glu Asn Asn His Thr Val Gln Ala Thr Ile Arg  
 65 70 75 80  
 Tyr Arg Asn Gly Tyr Glu Gly Lys Trp Asp Thr Ile Arg Gln Glu Tyr  
 85 90 95  
 Glu Phe Pro Asn Tyr Thr Ala Gly Asp Tyr Asn Ser Met Lys Thr Thr  
 100 105 110  
 Asp Lys Ser Pro Pro Pro Pro Ala Ser Tyr Leu Phe Gly Tyr Thr Gly  
 115 120 125  
 Ser Ser Cys Ala Val Val Tyr Val Asn Ser Ile Gly Pro Val Arg Ser  
 130 135 140  
 Asn Ser Glu Asn Pro Pro Glu Arg Leu Thr Ala Ser Gln Glu Ser Ala  
 145 150 155 160  
 Gln Arg Asp Cys Val Leu Trp Val Asp His Asp Glu Lys Ala Thr Gln  
 165 170 175  
 Glu Gln Cys Cys Glu Asp Phe Phe Lys Thr His Cys Lys Glu Thr Val  
 180 185 190  
 His Val Ile Tyr Asp Val Asn Arg Cys Lys Glu Asn Gly Ser Glu  
 195 200 205

<210> 6  
 <211> 198  
 <212> PRT  
 <213> Boophilus microplus

<400> 6  
 Met Asn Ser Ala Leu Trp Val Leu Leu Gly Ser Ser Leu Trp Leu His  
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 Thr Val Ala Phe Met Ile Pro Thr Trp Ala Asp Glu Gly Arg Phe Gly  
 20 25 30  
 Lys Tyr Gln Asn Ala Trp Lys Ala Leu Asn Gln Arg Ile Asn Thr Thr  
 35 40 45  
 His Val Leu Val Arg Ser Thr Tyr Ile Asp Asn Pro Tyr Leu Trp Gly  
 50 55 60  
 Lys Asn Phe Ser Cys Val Arg Ala Arg Thr Val Glu Val Phe Pro Ser  
 65 70 75 80  
 Ser Lys Thr Val Glu Leu Glu Phe Ser Phe Arg Asn Arg Thr Gly Ile  
 85 90 95  
 Leu Cys Met Arg Asn Gln Thr Val Arg Ala Gly Lys Asp Tyr Phe Tyr  
 100 105 110  
 His Gln Pro Asn Ala Phe Glu Phe Met Leu Arg Gly Asn Arg Ser Phe  
 115 120 125  
 Ser Asn Ala Val Met Phe Thr Asp Gly Met Thr Cys Asn Leu Leu Ser  
 130 135 140  
 Phe Pro Tyr Gln Arg Asn Lys Pro Gln Cys Glu Leu Trp Val Lys Asp  
 145 150 155 160  
 Thr Arg Val Asp Asn Ile Pro Pro Cys Cys Ser Phe Met Phe Asp Tyr  
 165 170 175  
 Leu Cys Pro Gln Pro Arg Pro Phe Ile Ile Tyr Asp Lys Ala Met Cys  
 180 185 190  
 Thr Val Arg Pro Pro Arg  
 195

<210> 7  
 <211> 203  
 <212> PRT  
 <213> Boophilus microplus

<400> 7

Met Lys Ala Leu Leu Ile Ala Val Gly Tyr Leu Ala Ala Val Thr Ala  
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Ala Pro Gln Ala Ser Pro Ser Ser Pro Arg Asn Glu Pro Leu Lys Asn  
20 25 30  
Thr Thr Trp His Ser Lys Glu Leu Lys Asn Tyr Gln Asp Ala Trp Lys  
35 40 45  
Ser Ile Asn Gln Asn Val Ser Thr Thr Tyr Tyr Phe Leu Arg Ser Thr  
50 55 60  
Tyr Asn Asn Asp Ser Val Trp Gly Lys Asn Phe Thr Cys Leu Ser Val  
65 70 75 80  
Thr Val Thr Ser Lys His Glu Ser Thr Phe Thr Val Glu Tyr Asn Thr  
85 90 95  
Thr Tyr Lys Asn Gln Ser Gln Gln Trp Val Ser Met Thr Glu Asn Val  
100 105 110  
Thr Ala Val Gln Glu Glu Gly Tyr Asp Val Lys Asn Ile Ile Gln Trp  
115 120 125  
Thr Thr Glu Asn Asn Thr Lys Phe Asn Asp Thr Val Val Phe Thr Asp  
130 135 140  
Gly Gln Thr Cys Asp Leu Leu Tyr Ile Pro Tyr Lys Glu Asn Gly Tyr  
145 150 155 160  
Glu Leu Trp Val Arg Ser Asp Tyr Leu Gln Asn Thr Pro Thr Cys Cys  
165 170 175  
Gln Phe Ile Phe Asp Leu Val Ala Leu Gly Arg Thr Thr Tyr Asn Ile  
180 185 190  
Ser Thr Pro Asp Cys Val Thr Lys Thr Ser Arg  
195 200

<210> 8

<211> 203

<212> PRT

<213> Boophilus microplus

<400> 8

Met Lys Ala Leu Leu Ile Ala Val Val Tyr Leu Thr Ala Val Thr Ala  
1 5 10 15  
Ala Asp Gln Ala Pro Pro Ser Ser Thr Arg Asn Glu Pro Leu Glu Lys  
20 25 30  
Thr Thr Trp His Asn Gln Thr Leu Gly Arg Tyr Gln Asp Ala Trp Lys  
35 40 45  
Ser Ile Asn Gln Ser Val Gly Thr Thr Tyr Tyr Phe Leu Arg Ser Thr  
50 55 60  
Tyr Asn Asn Asp Ser Val Trp Gly Lys Asn Phe Thr Cys Leu Ser Val  
65 70 75 80  
Thr Val Thr Ser Lys Tyr Glu Ser Thr Phe Thr Val Glu Tyr Asn Thr  
85 90 95  
Thr Tyr Lys Asn Gln Ser Gln Gln Trp Val Ser Met Ser Glu Asn Val  
100 105 110  
Thr Ala Val Gln Glu Gly Gly Tyr Ser Val Lys Asn Ile Ile Gln Trp  
115 120 125  
Thr Thr Glu Asn Asn Thr Lys Phe Asn Asp Thr Val Val Phe Thr Asp  
130 135 140  
Gly Gln Thr Cys Asp Val Leu Tyr Ile Pro Tyr Lys Glu Asp Gly Tyr  
145 150 155 160  
Glu Leu Trp Val Arg Ser Glu Tyr Leu Gln Asn Thr Pro Thr Cys Cys  
165 170 175  
Gln Phe Ile Phe Asp Leu Val Ala Leu Gly Arg Thr Thr Tyr Asn Ile

180 185 190  
 Ser Thr Pro Asn Cys Val Ala Thr Thr Ala Gly  
 195 200

<210> 9  
 <211> 285  
 <212> PRT  
 <213> Boophilus microplus

<400> 9  
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 Met Asn Thr Gln Arg Leu Gly Lys Met Gln Asp Ala Trp Lys Ser Leu  
 35 40 45  
 Glu Lys Ala Thr Asn Gln Ser Tyr Val Leu Val Phe Arg Ser Arg Asn  
 50 55 60  
 His Glu Pro Glu Ile Ser Cys Val Tyr Val Arg Ala Ser Asn Ile Asn  
 65 70 75 80  
 Asn Asp Thr Lys Thr Ala Thr Tyr Thr Arg Thr Tyr Tyr Asn Met Thr  
 85 90 95  
 Ala Asn Ala Thr Met Thr Val Asn Tyr Thr Ala Arg Ala Leu Lys Gln  
 100 105 110  
 Val Asp Tyr Glu Ser Glu Asn Val Val Arg Val Asn Leu Thr Gly Gly  
 115 120 125  
 Val Pro Ser Asn Asp Thr Val Pro Leu Gly Ser Tyr Glu Tyr Val Glu  
 130 135 140  
 Tyr Gly Asn Tyr Ser Cys Asn Ser Ser Ser Thr Pro Phe Leu Asp Ala  
 145 150 155 160  
 Val Gln Met Ala Ser Gln Gly Gln Ser Arg Gly Pro Asp Ile Glu Gly  
 165 170 175  
 Arg Thr Tyr Leu Asp Phe Tyr Val Val Tyr Asn Gln Pro Ser Cys Asn  
 180 185 190  
 Val Leu Lys Ser Pro Leu Leu Gly Gly Ala Cys Asp Phe Trp Val Thr  
 195 200 205  
 Glu Ser Glu Leu Gln Lys Ala Leu Asn Lys Thr Ser Glu Lys Lys Lys  
 210 215 220  
 Thr Lys Leu Glu Ala Arg Ala Arg Lys Ala Gly Gly Asp Ser Asp Asp  
 225 230 235 240  
 Gln Gly Pro Glu Leu Glu Val Val Phe Lys Asn Leu Pro Pro Pro Cys  
 245 250 255  
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 260 265 270  
 Asn Lys Thr Ile Cys Asn Arg Thr Asp Ser Ala Ala Val  
 275 280 285

<210> 10  
 <211> 284  
 <212> PRT  
 <213> Boophilus microplus

<400> 10  
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 Gly Trp Arg Thr Arg Ile Gln Glu Lys Gly Pro Glu Asn Asn Pro Leu  
 20 25 30

Met Asn Thr Gln Arg Leu Gly Lys Met Gln Asp Ala Trp Lys Ser Leu  
 35 40 45  
 Glu Lys Ala Ala Asn Gln Thr Tyr Val Leu Val Phe Arg Ser Arg Asn  
 50 55 60  
 His Glu Pro Asp Ile Ser Cys Val Tyr Val Arg Ala Ser Asn Leu Asp  
 65 70 75 80  
 Asn Ala Thr Lys Thr Ala Asp Tyr Thr Arg Thr Tyr Tyr Asn Met Thr  
 85 90 95  
 Ala Lys Gln Asn Val Ser Val Asn Tyr Thr Ala Arg Ala Leu Lys Gln  
 100 105 110  
 Val Asp Tyr Glu Ser Glu Asn Val Arg Val Asn Leu Thr Gly Gly  
 115 120 125  
 Val Pro Ser Asn Asp Thr Val Pro Pro Gly Ser Phe Glu Tyr Val Glu  
 130 135 140  
 Tyr Gly Asn Tyr Ser Cys Asn Ser Ser Ser Thr Pro Phe Leu Asp Ala  
 145 150 155 160  
 Val Gln Met Ala Ser Gln Gly Gln Ser Trp Gly Pro Asp Val Glu Gly  
 165 170 175  
 Arg Thr Tyr Leu Asp Phe Tyr Val Val Tyr Asn Gln Pro Ser Cys Asn  
 180 185 190  
 Val Leu Lys Ser Pro Leu Leu Gly Gly Ala Cys Asp Phe Trp Val Pro  
 195 200 205  
 Gln Ser Glu Leu Asp Lys Val Leu Asn Lys Lys Gly Asp Lys Lys Lys  
 210 215 220  
 Pro Ala Lys Ser Ser Ser Gln Asn Gly Asp Glu Gly Ser Asp Ala Glu  
 225 230 235 240  
 Gln Pro Glu Leu Glu Ala Ile Phe Lys His Leu Pro Pro Pro Cys Arg  
 245 250 255  
 Ala Ala Phe Ile Thr Ser Cys Gly Tyr Pro Asn Phe Leu Met Tyr Asn  
 260 265 270  
 Lys Thr Ile Cys Asn Ala Ala Gly His Ala Ala Asn  
 275 280

<210> 11  
 <211> 321  
 <212> PRT  
 <213> Boophilus microplus

<400> 11  
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 20 25 30  
 Asn Ser Pro Leu Leu Asn Asn Gln His Leu Gly Leu Phe Gln Asp Ala  
 35 40 45  
 Trp Lys Thr Ile Glu Glu Thr Ser Asn Asp Thr Tyr Val Leu Met Phe  
 50 55 60  
 Arg Ser Lys His Tyr Asp His Glu Asn Lys Ala Lys Cys Val Phe Val  
 65 70 75 80  
 Thr Ala Asn Ile Thr Asp Ser Arg Asn Lys Thr Ala Asn Tyr Thr Ile  
 85 90 95  
 Thr Tyr Tyr Asp Thr Thr Thr Asn Thr Ser Asn Asn Phe Thr Ile Pro  
 100 105 110  
 Val Arg Ala Leu Asn Gln Thr Asp Tyr Ser Leu Glu Asn Val Ile Arg  
 115 120 125  
 Ala Ser Phe Asn Gly Asp Thr Pro Ser Ser Thr Pro Ala Pro Pro Gly  
 130 135 140

Ser Ser Val Tyr Ile Gln Tyr Asn Asn Val Thr Cys Tyr Ala Gln Tyr  
145 150 155 160  
His Pro Phe Ser Asn Asn Gly Ile Ser Ala Lys Tyr Asp Glu Met Pro  
165 170 175  
Arg Asp Gly Arg Asn Tyr Leu Phe Asp Asn Phe Ile Gly Ala Tyr Leu  
180 185 190  
Asp Phe Tyr Val Val Phe Ser Gln Pro Thr Cys Asn Val Leu Arg Val  
195 200 205  
Arg Glu Gly Cys Asp Phe Trp Leu Arg Lys Thr Glu Leu Pro Ser Leu  
210 215 220  
Leu Lys Ala Ala Glu Asn Asp Asp Asn Asp Asn Thr Glu Ser Leu Lys  
225 230 235 240  
Asn Tyr Trp Glu Arg Arg Ile Asn Asn Thr Lys Thr Arg Phe Arg His  
245 250 255  
Asn Thr Lys Lys Cys Lys Met Tyr Val Gln Arg Tyr Ser Ile Glu Lys  
260 265 270  
Ala Glu Asp Val Phe Lys Asn Thr Ala Phe Lys His Leu Pro Ser Asp  
275 280 285  
Cys Arg Phe Ala Phe Leu Ala Ala Cys Gly Asn Pro Ala Phe Thr Ile  
290 295 300  
Tyr Asp Pro Glu Thr Cys Asn Ser Ser Leu Pro Ala Asn Met Ala Glu  
305 310 315 320  
Ser

<210> 12

<211> 770

<212> DNA

<213> Rhipicephalus appendiculatus

<400> 12

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aagccgataa	gccagtttgg	gcggatgaag	cggcaaacgg	ggaacaccaa	gacgcctgga	120
agcatctcca	aaaactcgtt	gaagagaatt	acgacttgat	aaaagccacc	tacaagaacg	180
accagtttgg	gggtaacgac	ttcacttgcg	tgggtactgc	agcgcagaat	ttgaacgagg	240
acgagaagaa	cgttgaagca	tggtttatgt	ttatgaataa	tgctgatacc	gtataccaac	300
atacttttga	aaaggcgact	cctgataaaa	tgtacggtta	caataaggaa	aacgccatca	360
catatcaaac	agaggatggg	caacttctca	cagacgtcct	tgcattctct	gacgacaatt	420
gctatgtcat	ctacgctctt	ggcccagatg	gaagtggagc	aggttacgaa	ctctgggcta	480
ccgattacac	ggatgttcca	gccagttgtc	tagagaagtt	caatgagtat	gctgcaggtc	540
tgccggtagc	ggagctatac	acaagtgtat	gcctcccaga	ataacttggg	catatcgtaa	600
tttcaacttc	aaagtgtgtt	attgtcagca	tatgtctcga	gtgtttgatg	tagtgcgttc	660
gatgatgcca	ttcatctagg	tttcgggtgt	tcggtacttt	atgctcactg	ccgacggcca	720
gcacgagtac	tcgaaaataa	agtattctga	aatcggaata	aaaaaaaaaa		770

<210> 13

<211> 793

<212> DNA

<213> Rhipicephalus appendiculatus

<400> 13

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gtgcacacca	agacgcctgg	aagagtctga	aagcggacgt	tgaaaacgtt	tactacatgg	180
tgaaggccac	ctataagaat	gacccagtgt	ggggcaatga	cttcacttgc	gtgggtgtta	240
tggaacaatga	tgtcaacgag	gatgagaaga	gcattcaagc	agagtttttg	tttatgaata	300
atgctgacac	aaacatgcaa	ttcgccactg	aaaaggtgac	tgctgttaaa	atgtatgggt	360

acaatagggga	aaacgccttc	agatacgaga	cggaggatgg	ccaagttttc	acagacgtca	420
ttgcatactc	tgatgacaac	tgcatgtca	tctacgttcc	tgccacagac	ggaaatgagg	480
aaggttacga	actatggact	acggattacg	acaacattcc	agccaattct	ttaaataagt	540
ttaatgagta	cgctgtagg	agggagacaa	gggatgtatt	cacaactgct	tgccatagag	600
aataacttca	gaatgtcgtt	ctttcaaagc	gaaaaaccaa	caatgtgaac	atcggcttgc	660
tgtgctcgac	gtagccagcg	ataatgttgt	tttctgggt	ttctgggttt	ggatactttt	720
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aaaaaaaaaa	aaa					793

<210> 14

<211> 753

<212> DNA

<213> *Rhipicephalus appendiculatus*

<400> 14

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agccttcagc	aagaccaaaa	caagagatac	tatttggcac	aagcgacaca	aacgactgac	180
ggcgtatggg	gtgaagagtt	tacttgtgtg	agtgttacgg	ctgagaagat	tggaaagaaa	240
aaacttaacg	ctacgatcct	ctataaaaaat	aagcacctta	ctgacctgaa	agagagtcat	300
gaaacaatca	ctgtctggaa	agcatacgac	tacacaacgg	agaatggcat	caagtacgag	360
acgcaagggg	caaggacgca	gactttcgaa	gatgtctttg	tattctctga	ttacaagaac	420
tgcatgttaa	ttttcgttcc	caaagagaga	ggaagcgacg	agggcgacta	tgaattgtgg	480
gttagtgaag	acaagattga	caagattccc	gattgctgca	agtttacgat	ggcgtacttt	540
gcccaacagc	aggagaagac	ggttcgtaat	gtatacactg	actcatcatg	caaaccagca	600
ccagctcaga	actgatattc	tggtaatgct	tgaaccgtaa	tggttcgacc	tgcagtctag	660
aaacattttac	caccatcacg	gtgattatct	taccgtagtt	tcttaggtct	tgttctttga	720
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<210> 15

<211> 719

<212> DNA

<213> *Rhipicephalus appendiculatus*

<400> 15

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aaatatcaag	atgcctggaa	aagcatcgat	cagggcggtg	cggtgactta	tgctcttgca	180
aagacaacat	atgagaatga	cacaggatca	tggggatccc	agtttaagtg	cctccaggta	240
caagaaatag	aaagaaaagga	agaagactat	acagttacat	ctgtttttcac	ctttagaaat	300
gcgtcttctc	caatcaagta	ttacaacgtg	acagaaacag	tgaaggccgt	ttttcaatat	360
ggatacaaaa	acataaggaa	tgcaattgaa	taccaagtgg	gcggtggact	taacataacc	420
gacacgtcga	ttttcactga	tggaagaatta	tgcatgtttt	tctatgttcc	caatgcagat	480
caaggtttgtg	agctctgggt	caaaaagagt	cactacaaac	acgtaccaga	ctactgcacg	540
ttcgtgtttca	atgtttttctg	tgcgaaagac	aggaaaacct	acgatataat	taatgaagaa	600
tgtgttttata	acggcgaacc	ctggctttta	aggcaaaaaa	tctataaaat	acggttttctg	660
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<210> 16

<211> 832

<212> DNA

<213> *Rhipicephalus appendiculatus*

<400> 16

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tttctcaaga	aaggcaagag	atacgatatg	aaacagagaa	ccttccaaac	acctaactca	180

gacgacacta	aatgcctgtc	cagtactatc	gacggaaaaga	atgaaaataa	ccatacagta	240
caagcaacga	taagatatcg	aaatggttat	gaaggaaaat	gggacaccat	ccgccaggag	300
tacgagttcc	ccaactacac	tgcaggagac	tacaactcca	tgaagacaac	agacaaatcc	360
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gtgaattcca	ttggacctgt	tcgtagcaat	tctgaaaacc	caccagaaaag	actcacagca	480
agtcaggaaa	gtgcacaacg	cgattgcgtc	ctttgggtcg	atcacgatga	aaaagctacc	540
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tacgacgtga	atagatgcaa	ggagaatggc	agtgaataac	acgatgccgg	gaatggcatg	660
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tactttagac	caacataattc	ttcctttttc	gacttcaatg	atatgatcta	ggttgtaaaa	780
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<210> 17

<211> 1488

<212> DNA

<213> *Ambyomma variegatum*

<400> 17

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ccaagcaggt	catcgtcttg	tccactgacg	atgaactctg	ccttgtgggt	tttactagga	180
tcatecttat	ggctgcatac	ggtagcgctt	atgattccca	catgggcaga	tgaaggcagg	240
tttggcaagt	accagaacgc	ctggaaggcc	ctgaatcagc	ggattaacac	aacacatgtc	300
cttgtgaggt	caacgtatat	cgacaatcca	tattttatggg	gcaagaactt	ctcatgcgta	360
cgcgctcgaa	ctgtcgaagt	ctttcccagc	agcaagactg	tggaactgga	gttttagtttc	420
agaaacagga	ctggtatat	gtgcatgaga	aatcaaaccg	ttcgagctgg	aaaggattac	480
ttttatcate	agcctaacgc	cttcgaattc	atgctgagag	gtaacagggtc	gttttctaac	540
gctgtcatgt	ttaccgacgg	aatgacatgt	aatctgctca	gctttccata	ccagcgcaac	600
aaaccacaat	gcgaactatg	ggtgaaggac	acgcgcgtcg	acaacattcc	cccttgttgc	660
tcgttcatgt	tcgactattt	gtgcccacag	cctcgtccat	tcatcattta	cgacaaagca	720
atgtgcacgg	tgaggccacc	ccgctagaaa	gaaaagggat	gaaaaggcta	ctcgaagaag	780
caacaaccaa	tcagtcccc	caagagaacc	gttccagctc	tgcgaaagtt	gcgcctccca	840
aaacacatac	atttactctg	aaagatgacc	gatgcagctg	caaattcgtg	tcctagaact	900
caagtgcgtg	tttggaaact	cggaaaggag	acagtagaag	ctaactgctg	tgatacctag	960
gccaggcatt	tccgctcggg	actgtttttt	atgaataggg	taggggtgaaa	gtattttggc	1020
tttgctgtgg	cccaataaat	agcgtatat	agcggactag	catcgaaagt	ccagatgcta	1080
taaagcagct	aaaactcact	tctgcctgga	acttcgatag	gtattgaata	gatcatgcgc	1140
gcacagaaaa	gaaaagtatc	aatcaaaaaca	taaaaagcat	tcttcgcatg	tgcgcaaacg	1200
attccctaag	tccacgctaa	aaataggtgt	catttcatat	agcatcgagt	tctatacggt	1260
cttaagatgc	taccggtcat	tcattccttt	ctcgtctatg	cctcatggat	ctgaaccaag	1320
ttcttctatt	gcctccttgt	tttccggtag	ctacagagtt	cagcagcacc	attgctagtg	1380
catattttat	cttcgtgctg	tgtttgtcgc	agtatatatt	tctgcctatt	cacgatattt	1440
gcacaatgta	ataaaacatt	tgctgcctta	aaaaaaaaaa	aaaaaaaaaa		1488

<210> 18

<211> 760

<212> DNA

<213> *Boophilus microplus*

<400> 18

ctccagctct	gcttcgacga	tgaaggctct	cctgatcgct	gtcggtacc	tggtgtccgt	60
cacagcggca	ccccagctt	cgccttcctc	tccgaggaac	gaaccactca	agaatactac	120
gtggcacagc	aaggaactga	aaaattatca	agatgcgtgg	aagtccatca	atcaaaacgt	180
cagcactacc	tactacttcc	tcagatcaac	ctacaacaac	gacagtgtct	ggggtaaaaa	240
tttcacctgt	cttagcttca	cggtagacatc	gaaacatgaa	tcaacgttca	ccgtcgaata	300
taacaccacg	tacaaaaatc	agagccaaca	atgggtcagc	atgacggaaa	acgtcacggc	360
cgtgcaggag	gagggctacg	acgttaaaaa	tatcattcag	tggaacaacag	agaataaacac	420

aaagttcaat	gatactgttg	tttttacgga	cggccagact	tgtgatctgt	tgtacatccc	480
gtacaaagaa	aacggttacg	agctgtgggt	gcgttcggat	tacctgcaga	acactccaac	540
gtgctgccag	ttcatctttg	acctcgtcgc	attgggacgt	accacgtaca	atatctccac	600
tcctgactgc	gtgaccaaaa	cctctcgtta	gaccgtgaaa	gccgcggctt	atgctactcg	660
actgctcagg	ttggaagagt	agggagcccc	gacgcgcact	actactaaaa	atgattccaa	720
ataaagtatt	caaacatttc	aaaaaaaaaa	aaaaaaaaaa			760

<210> 19

<211> 765

<212> DNA

<213> Boophilus microplus

<400> 19

agtgactcct	gctctgcttc	gacgatgaag	gctctcctga	tcgctgtcgt	ctacctgact	60
gccgtcacag	cggcagacca	agctccgcct	tcctctacga	ggaatgaacc	actcgagaaa	120
actacctggc	acaaccagac	actgggacgt	tatcaagatg	cgtggaagtc	catcaatcaa	180
agcgtcggca	ctacctacta	cttcctcaga	tcaacctaca	acaacgacag	cgtgtgggggt	240
aaaaatttca	cctgtcttag	cgtcacgggtg	acatcgaaat	atgaatcaac	gttcaccgtc	300
gaatataaca	ccacgtacaa	aaatcagagc	caacaatggg	tcagcatgtc	ggaaaacgtc	360
acggccgtgc	aggagggcgg	ctacagtgtt	aaaaacatca	ttcagtggac	aacggagaat	420
aacacaaagt	tcaatgatac	tgttggtttt	acggacggcc	agacttgtga	tgtgttatac	480
atcccgtaca	aagaagacgg	ttacgagctg	tgggtgcgtt	cggaatacct	gcagaacact	540
ccaacgtgct	gccagttcat	ctttgacctc	gtcgcattgg	gacgtaccac	gtacaatatc	600
tcactccta	actgcgtggc	caccaccgct	ggttagacaa	tgcaagccgc	ggcttaattt	660
actcgaccgc	tcaggttggg	agtgccggga	gcctcgacgg	gcactactac	ttaaaatgat	720
ttcgaataaa	gtattcaagc	atttctggaa	aaaaaaaaaa	aaaaa		765

<210> 20

<211> 1046

<212> DNA

<213> Boophilus microplus

<220>

<221> misc\_feature

<222> (1)...(1046)

<223> n = A,T,C or G

<400> 20

gatggcgctc	agatttgcac	ttctgctggc	gtgcatcgtc	acggcatgtg	gctggagaac	60
acggattcaa	gagaaagggtc	ccgagaacaa	ccctctcatg	aacacccaac	gtttgggaaa	120
aatgcaagac	gcatggaaga	gtctggaaaa	ggcaacaaat	cagtcgtatg	tcttgggtgtt	180
ccgctcaaga	aatcacgaac	cagagatatac	ctgcgtgtac	gtgagggcta	gtaatatataa	240
taatgacact	aaaactgcaa	cttataccag	aacatattac	aatatgacgg	caaacgcaac	300
catgacgggtg	aattatactg	caagagctct	gaagcaagtg	gactatgagt	cggaaaatgt	360
cgtacgagta	aacctgacag	gtgggggtccc	cagcaacgat	acagttcctc	ttggaagcta	420
cgaatacgtc	gagtacggta	attactcctg	caatagctca	tcgacaccct	ttttggatgc	480
tgtgcaaatg	gcatcgcaag	ggcaatccag	agggccggat	atcgaagggc	gcacatatct	540
agacttctac	gtcgtctaca	atcaaccatc	gtgcaatgtc	ctgaagtccc	cgctcctggg	600
aggtgcttgt	gacttttggg	tgacagaatc	cgagttgcaa	aaagcactaa	ataagacatc	660
agagaagaaa	aaaacaaagc	tagaagcgag	agcaaggaaa	gctggaggag	attccgatga	720
ccagggacct	gaactggagg	tcgtcttcaa	aaatctgccc	cctccctgcc	gcgcagcggtt	780
cataacttcc	tgcggtctatc	caacttttct	tatgtacaac	aagaccatct	gtaatcgaac	840
ggattctgct	gcggtgtgaa	cgccccctgc	gagcaagtag	aacgtccgtg	aagacagcag	900
gaagatagtt	gactgttttg	ttggcggaat	gtgactacta	gtctgaatca	ttaaaaagat	960
tcngctgacg	ggtgtggcgg	gaactttttt	aaatgaaatt	ggtcatactt	gttgaaagac	1020
aaaaataaaa	caatatgtta	ctcctc				1046

<210> 21  
<211> 1025  
<212> DNA  
<213> *Boophilus microplus*

<400> 21  
ggaaaccagg atggcgctca gatttgcact tctgctggcg tgcacgtca cggcatgtgg 60  
ctggagaaca cggattcaag agaaagggtcc cgagaacaac cctctcatga acaccaacg 120  
tttgggaaaa atgcaagacg catggaagag tctggaaaag gcagcaaatac agacgtatgt 180  
cttgggtgttc cgctcaagaa atcacgaacc agatatatcc tgcgtctacg tgagagctag 240  
taatttagat aatgcaacta aaactgcaga ttataaccaga acatattaca atatgacggc 300  
aaaacaaaac gtgtcggtaa attatactgc aagagctctg aagcaagtgg actatgagtc 360  
ggaaaatgtc gtacgagtaa acctgacagg tgggggtcccc agtaacgata cagttcctcc 420  
tggaagcttc gaatacgtcg agtacggtaa ttactcctgc aatagctcat cgacaccctt 480  
tttggatgct gtgcaaatgg catcgcaagg gcaatcctgg gggccggatg tcgaagggcg 540  
cacatatcta gatttctacg tctgtctaca tcaaccgtcg tgcaatgtcc tgaagtcctcc 600  
gctcctggga ggtgcttggtg acttctgggt gccacaatca gagttggaca aggtactaaa 660  
caaaaaagga gataagaaaa agccagctaa gtcaagcagt caaaatggag acgaagggttc 720  
tgatgccgag caacctgaac tggaggccat ctttaaactat ctacccccctc cctgccgcgc 780  
agcgttcata acttctctgc gctatccaaa ttttctcatg tacaacaaga cgatctgtaa 840  
tgcagcgggt catgctgcga actgaacgtc ctctgcgaac gagtagagcg tgcgtaaaaa 900  
caactggtct gaatctttta agaaattcgg caaagtgcgg gtggcgcgaa cttttatcaa 960  
actggtcata catgtgaaag aaaaaataa aacaaaatgt gcataaaaaa aaaaaaaaaa 1020  
aaaaa 1025

<210> 22  
<211> 1156  
<212> DNA  
<213> *Boophilus microplus*

<220>  
<221> misc\_feature  
<222> (1)...(1156)  
<223> n = A,T,C or G

<400> 22  
cgaagagcag gtacgattcg aatctttgca atggacattc gcagcgtgtg tttgttcgcg 60  
tgcacgtctc cggcgtgttg tggtttttgg cgctggacaa cacggagggt aactaaaaag 120  
cctgataaca gccctctgtt gaacaaccaa catcttggtc ttttccagga cgcattggaag 180  
actatagaag agacgtccaa tgatacgtat gtcctgatgt tccgctcaaa acattacgac 240  
cacgagaaca aggctaaatg tgtcttcgta acggcaaata ttactgactc ccggaacaaa 300  
actgccaaat acacaataac gtattacgat actacaacaa atacatccaa caattttaca 360  
atcccagtga gagctctgaa ccaaactgac tactacttag aaaatgtgat tcgagcaagc 420  
ttcaacggcg aacttccaag ctctactcca gccctccccg gaagcagcgt gtacattcag 480  
tataataatg ttacctgcta cgcccaatat caccattttt caaataatgg aatcagtga 540  
aaatatgatg aaatgccccg ggatggccga aattacttgt tcgacaattt tattggtgct 600  
tacttggact tctacgtggt gttcagccag ccgacatgca acgttctcag agtccgagaa 660  
ggatgtgact tctggctaag gaaaactgag ttgccaagcc tactgaaagc agcagaaaaat 720  
gatgacaacg ataacacgga atcgctgaag aactattggg aaagaagaat aaataatact 780  
aaaacaagat ttcgacataa tactaagaaa tgtaagatgt acgtacaacg ttattcaatt 840  
gagaaggctg aagatgtctt taaaaacact gcttttaaac acctccccctc cgactgccgc 900  
tttgccttcc tggcgcgttg tggaaatcca gcattcacia tatacgaccc agaaacatgt 960  
aatagctccc tgccagctaa tatggcagaa agttaaatga gctattttcac ttcatgttgc 1020  
accgtatgcc tggatgcaa gaaggtgagg ttggacagga tacttccgaa ttatttttcc 1080  
agtctgcctt gtacgcacga aataacaaaa tatctgttga agccnncaac nnnnnnaana 1140  
anaaaaaana aaaaaa 1156

<210> 23  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<221> misc\_feature  
<222> (1)...(26)  
<223> n = A,T,C or G

<400> 23  
aayggngarc aycargaygc ntggaa

26

<210> 24  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<221> misc\_feature  
<222> (1)...(26)  
<223> n = A,T,C or G

<400> 24  
ktrtmrtcng tnryccanar ytcrtta

26

<210> 25  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> tagging sequence

<400> 25  
tatatgatca gaaaaccgcg tctggg

26

<210> 26  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> tagging sequence

<400> 26  
tatactcgag ccagggttcg ccgt

24

<210> 27  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> amplifying oligonucleotide

<400> 27  
tatgaagatg caggtagtgc 20

<210> 28  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> amplifying oligonucleotide

<400> 28  
atatgatcag ccagggttcg ccgt 24

<210> 29  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<400> 29  
tatgagctca tgaactctgc cttgtgg 27

<210> 30  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<400> 30  
tatggatccg ggggtggcctc accg 24

<210> 31  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> octapeptide

<400> 31  
Ala Glu Ala Phe Ala Glu Ala Trp  
1 5